vice-versa, resulting in the intermingling of the prairie and glade flora that we at present encounter. It is probable that most, if not all, of the species restricted to the southern Appalachian-Ozarkian area were in the Ozark region long before the other species of the prairies and glades which originated in the Ozark Plateau itself or spread into it from adjacent regions to the west or southwest. As has already been stated, the flora peculiar to the Ozark Plateau or to it and adjacent region west and southwest either originated in the Ozark region or spread into it when the last Tertiary uplift through that region resulted in elevated rocky glades and prairies in a drier and more semi-arid environment which favored the occupation by mostly xerophytic types of plants. Long before this uplift, however, the southern Appalachian-Ozarkian floristic element must have been dispersed before the northern intrusion of the Mississippi Embayment had all but severed its common connection. We have already seen that the southern Appalachian-Ozarkian flora probably originated sometime in the Mesozoic, perhaps following an uplift over these areas towards the close of the Cretaceous period. This latter flora, therefore, is probably the most ancient to be found in the Ozark region today. Thus, it may be concluded on the basis of the foregoing discussion that two geologically diverse floras occur in the Ozark region, (1) an ancient relic flora common to the southern Appalachians and Ozark region, and dating back in all probability to the uplift that occurred at the close of the Cretaceous, and (2) a younger flora, characteristic of the uplands and barrens of the Ozarks, a flora which probably originated in Tertiary times when this region was re-elevated in late Tertiary.

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DOUBLE FLOWERS IN THE WILD SWAMP BLUEBERRY, VACCINIUM CORYMBOSUM

H. F. Bergman

(Plate 289)

Abnormal flowers in any species of *Vaccinium* are almost unknown. The only cases reported by Penzig (3) are adesmie of the corolla in *V. dialypetalum* J. J. Sm., and tetramery or occasional trimery in *V. uliginosum* L., which are minor abnormalities. Weatherby (5) has

reported dialysis of the corolla in *V. pennsylvanicum* Lam. In the summer of 1926 a single plant of *Vaccinium corymbosum* L., bearing double flowers, was found growing wild in New Jersey but too late in the season to secure good specimens. No further attempt was made to obtain flowers until 1930 when specimens were collected,[1] photographed, and an examination of the flowers made. The area in which the plant grew was later burned over, so that the plant may have been destroyed unless it grows again from the roots, which cannot at present be determined.

The flowers did not appear to be different from those of any other plant of this species unless seen at close range. The calyx and corolla were of the normal form. Stamens of the normal form were lacking but in their place was a series of corolloid whorls, each enclosing successively another (FIG. 1). The size of the whorls diminished inwardly until in the center of the flower only small scale-like structures were found (FIG. 2). Each segment of the transformed stamens forming the corolloid whorls was tipped by an imperfectly developed brown anther. Some of the anthers contained a very limited amount of highly defective, much deformed, pollen. No vestige of a pistil was observed in any of the flowers examined.

A similar stamen condition is reported by Wilson (6) in double flowers of *Epigaea.* Double flowers due to petalody and pleiomery of the stamens have been reported by W. W. Bailey (1) in *Epigaea repens*, by Masters (2) in *Erica hiemalis*, and by Rehder (4) in *Rhododendron albiflorum.* The double flowers of *Epigaea repens* described by Bailey seem to be very similar in structure to those of the blueberry here described except that Bailey found an apparently normal pistil in the flowers of *Epigaea* which was completely lacking in the specimens here described. In the double flowers described by Masters (2) the stamens and pistil were absent but in place of the latter a short shoot covered with scale-leaves was found. No statement was made by Masters as to the presence of anthers on the supernumerary corollas. With these exceptions the condition described by him in the flowers of *Erica hiemalis* corresponds very closely to that found in the blueberry flowers.

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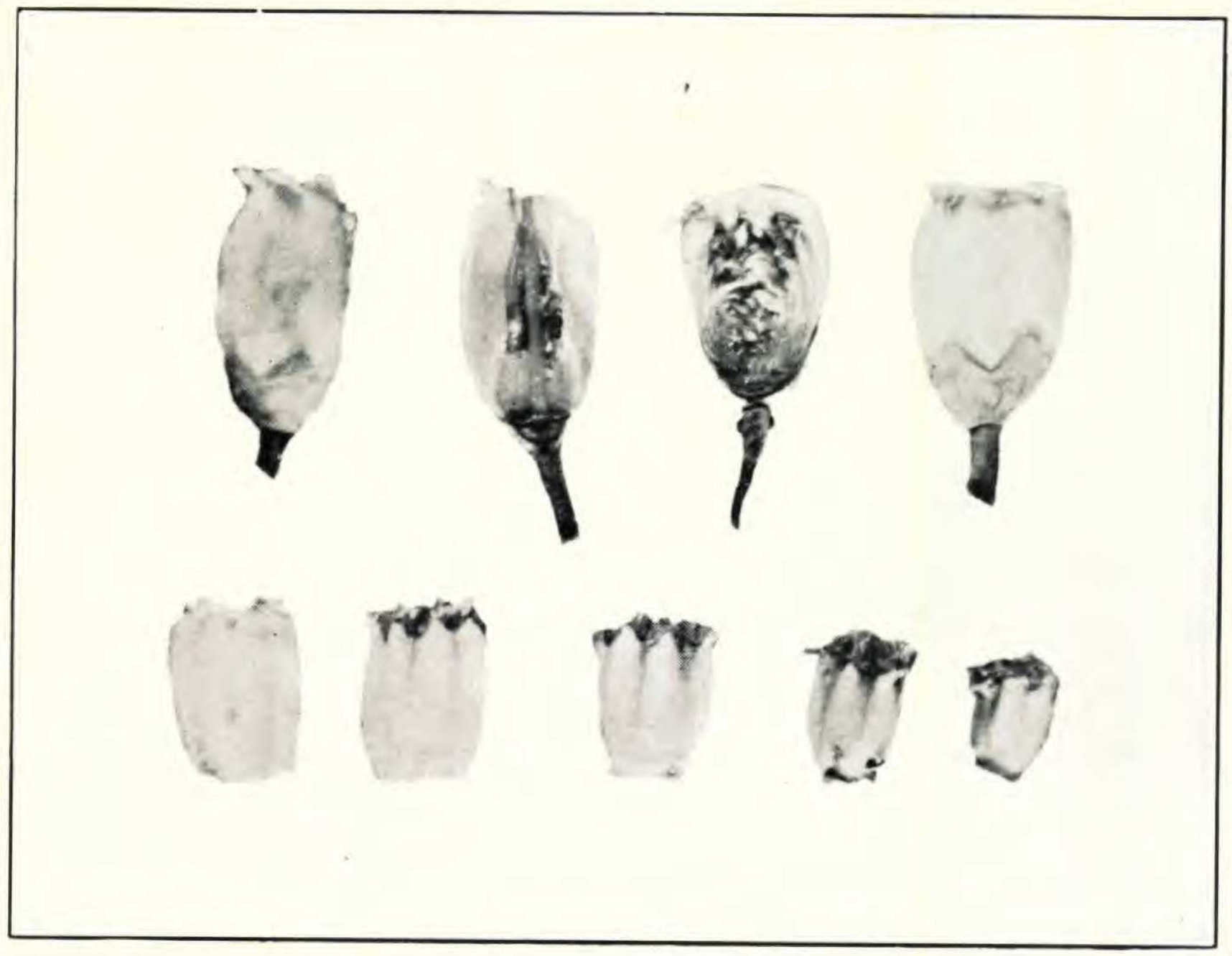

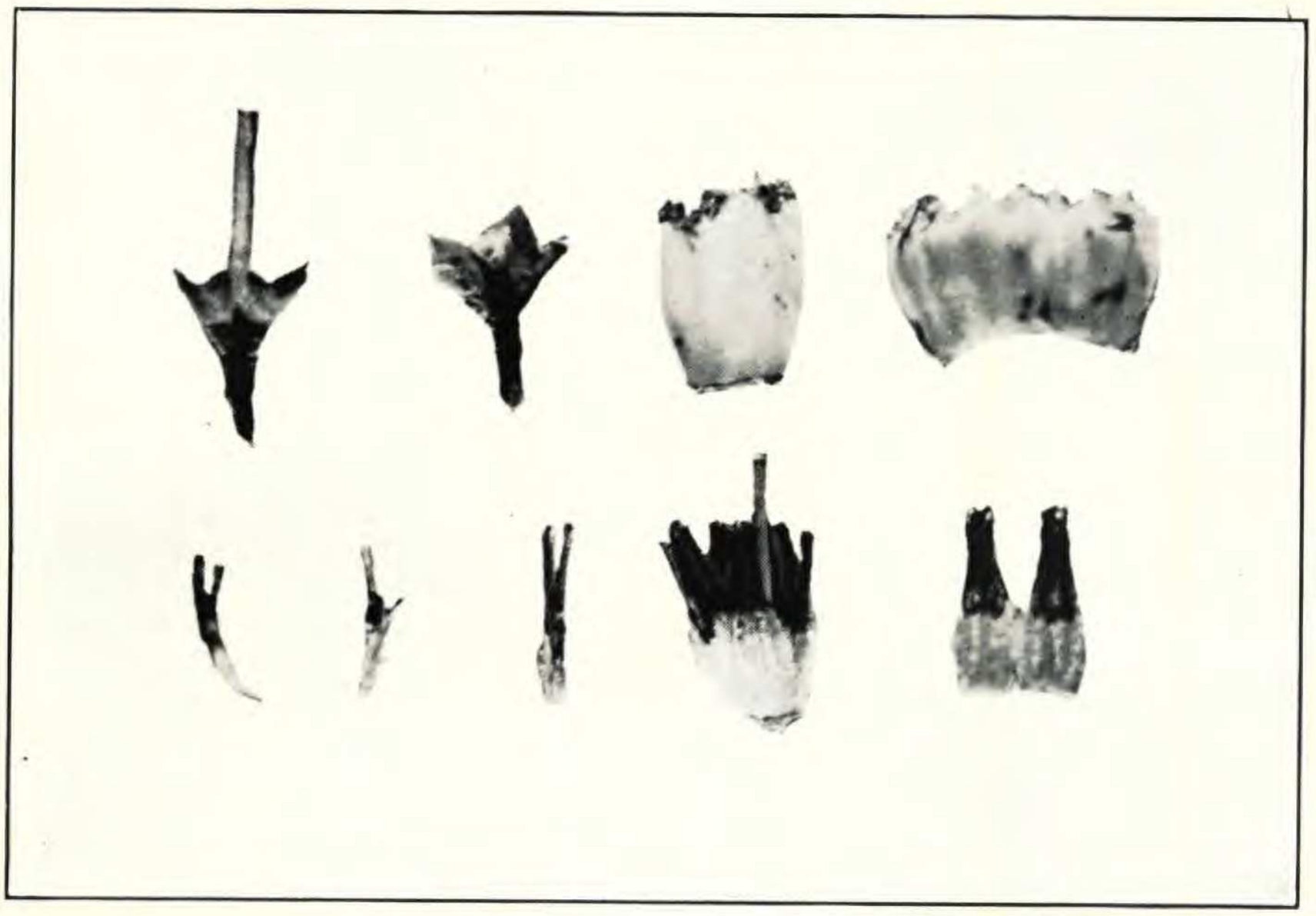

VACCINIUM CORYMBOSUM, × 2.

FIG. 1 (above). The two specimens at the left in the upper row show a normal blossom as seen externally and in longitudinal section; the specimens at the right the corresponding view of a double flower. In the bottom row, at the extreme left, is the corolla of a double flower; successive whorls of corolloid stamens are shown in order to the right.

FIG. 2 (below). Upper row left to right, the pistil of a normal flower; pistil of an abnormal flower showing absence of style and ovary; corolloid stamens; the same split lengthwise and opened out. The bottom row shows different views of normal stamens.